



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,800	03/03/2004	Masao Tomikawa	360842006010	4377
25227	7590	01/08/2007	EXAMINER	
MORRISON & FOERSTER LLP 1650 TYSONS BOULEVARD SUITE 300 MCLEAN, VA 22102			CHU, JOHN S Y	
			ART UNIT	PAPER NUMBER
			1752	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	01/08/2007	PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/790,800	TOMIKAWA ET AL.	
	<b>Examiner</b> John S. Chu	<b>Art Unit</b> 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 15 September 2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 2,4,9-12 and 14-22 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 2,4,9-12 and 14-22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

This Office action is in response to the RCE filed May 31, 2006.

### *Claim Rejections - 35 USC § 103*

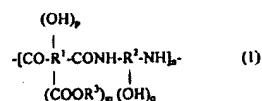
1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4, 9-12, and 14-22 rejected under 35 U.S.C. 103(a) as being unpatentable over OBA (5,585,217).

The claimed invention is drawn to the following:

17. (Previously Presented) A positive-working photosensitive resin precursor composition containing (a) a polymer in which structural units of the kind denoted by general formula (1) below are the chief component and (b) a photoacid generator, and the total carboxyl groups contained in said polymer is from 0.02 to 2.0 mmol/g;



wherein one of the following conditions (A) and (B) is satisfied:

- (A) a residual chlorine ion concentration is 30 ppm or less, or
- (B) a residual quantity of sodium, potassium and iron ions is 10 ppm or less,

wherein  $\text{R}^1$  is an organic group of valency from 3 to 8 having at least 2 carbon atoms,  $\text{R}^2$  is an organic group of valency from 2 to 6 having at least 2 carbon atoms,  $\text{R}^3$  is hydrogen or a monovalent organic group with from 1 to 10 carbons but it is not all hydrogen nor is it all a monovalent organic group with from 1 to 10 carbons.  $n$  is an integer of value from 3 to 100,000,  $m$  is 1 or 2,  $p$  and  $q$  are integers of value from 0 to 4  $p + q > 0$ , and

wherein some of the carboxyl groups of the polymer represented by general formula (1) are imidized by reaction with an adjacent amide group, and the percentage such imidization is from 1% to 50% of said carboxyl groups of the polymer represented by general formula (1).

OBA discloses a composition at Example 3 found in column 27, line 40-28, line 25.

The example discloses a mixture of a polyamic acid resin and a polyimide resin as the binder and a photosensitizer. This disclosure meets the claimed positive working photosensitive resin of claim 17 comprising a polymer of formula (1), and a photoacid generator. Claim 17 recites that the carboxyl groups of general formula (1), are imidized at a percentage from 1% to 50%. This claim is met by the disclosed blend of a polyimide in Example 3 of OBA wherein the polyimide in OBA is present in an amount of about 7% of the polyamic acid resin. This weight amount would fall within the claimed polyamic acid resin having 1% to 50% percentage of carboxyl groups imidized as claimed, because the polyimide resin is a final product of a thermal imidization of a polyamic acid resin. Polymer resins in a composition are made up of many polymer chains and the blend as recited in OBA et al would be identical in a formulation to the recited polyamic acid having a percentage of the polymer chains imidized as claimed in the photoresist composition.

Because OBA discloses a blend of polymer chains, each of the polymers when precipitated, would remove any impurities such as chlorine, sodium, potassium and iron ions. Thus the reference is asserted to meet the claimed ion concentration.

OBA et al lacks the recited hydroxyl group as required in Formula (1), however clearly teaches and suggests the use of hydroxyl containing diamines as a precursor for making the disclosed polyamic acid resin and polyimide resin, see column 7, line 55 – column 8, line 61.

It would have been *prima facie* obvious to one of ordinary skill in the art of photosensitive resin composition comprising polyamic acid resins blended by polyimide resins to use known hydroxyl group containing diamines as disclosed in column 8, lines 16-25 with the

Art Unit: 1752

reasonable expectation of same or similar results as recited in OBA et al for high resolution and excellent adhesion to the substrate.

The arguments by applicant have been carefully considered, however the rejection is repeated wherein the blended mixture of the polyamic acid and the polyimide wherein the polyimide is in a mixture of 7% of the polyamic acid resin would be identical to a single polyamic acid resin having 7% of the carboxyl groups imidized.

**3. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

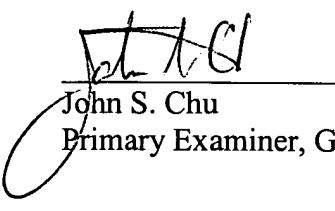
**4.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Art Unit: 1752

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
John S. Chu  
Primary Examiner, Group 1700

J.Chu  
January 3, 2007